WHAT IS CLAIMED IS:

1. A surface acoustic wave device using a Shear Horizontal type surface acoustic wave, comprising:

a quartz substrate; and

at least one interdigital transducer disposed on the quartz substrate and including electrodes having a larger mass-load effect than that of aluminum;

wherein a metallization ratio "d" and a normalized film thickness h/λ of the at least one interdigital transducer are within specific ranges such that a ripple caused by a transversal mode wave is about 0.5 dB or less, where "λ" is the wavelength of the surface acoustic wave and "h" is the film thickness of the electrodes of the at least one interdigital transducer.

2. A surface acoustic wave device according to Claim 1, wherein the at least one interdigital transducer includes at least one electrode layer made from a metal having a larger mass than that of aluminum.

3. A surface acoustic wave device according to Claim 1, wherein the at least one interdigital transducer is made from a single metal having a larger mass than that of aluminum.

4. A surface acoustic wave device according to Claim 1, further comprising a plurality of the interdigital transducers arranged to constitute a longitudinally coupled resonator filter.

5. A surface acoustic wave device according to Claim 4, further comprising a plurality of the longitudinally coupled resonator filters, which are connected in a cascade arrangement in at least two stages.

6. A surface acoustic wave device according to Claim 1, wherein the at least one interdigital transducer is arranged on the quartz substrate to constitute a one-port surface acoustic wave resonator.

7. A surface acoustic wave device according to Claim 1, wherein a plurality of the interdigital transducers are disposed on the quartz substrate;

each of the plurality of interdigital transducers constitutes a one-port surface acoustic wave resonator; and

the plurality of the interdigital transducers are connected to constitute a ladder-type filter on the quartz substrate.

8. A surface acoustic wave device according to Claim 1, wherein a plurality of the interdigital transducers are disposed on the quartz substrate;

each of the plurality of interdigital transducers constitutes a one-port surface acoustic wave resonator; and

the plurality of the interdigital transducers are connected to constitute a lattice-type filter on the quartz substrate.

9. A communication device comprising a surface acoustic wave device according to Claim 1.

10. A surface acoustic wave device using a Shear Horizontal type surface acoustic wave, comprising:

a quartz substrate; and

at least one interdigital transducer disposed on the quartz substrate and made from tantalum;

wherein a normalized film thickness h/λ of the at least one interdigital transducer is within a range of about $0.6d + 1.65$ to about $0.6d + 1.81$, where "d" is the metallization ratio of the interdigital transducer, "λ" is the wavelength of the surface acoustic wave, and "h" is the film thickness of the electrodes of the at least one interdigital transducer.

11. A surface acoustic wave device according to Claim 10, further comprising a plurality of the interdigital transducers arranged to constitute a longitudinally coupled resonator filter.

12. A surface acoustic wave device according to Claim 10, further comprising a plurality of the longitudinally coupled resonator filters, which are connected in a cascade arrangement in at least two stages.

13. A surface acoustic wave device according to Claim 10, wherein the at least one interdigital transducer is arranged on the quartz substrate to constitute a one-port surface acoustic wave resonator.

14. A surface acoustic wave device according to Claim 10, wherein a plurality of the interdigital transducers are disposed on the quartz substrate;

each of the plurality of interdigital transducers constitutes a one-port surface acoustic wave resonator; and

the plurality of the interdigital transducers are connected to constitute a ladder-type filter on the quartz substrate.

15. A surface acoustic wave device according to Claim

10, wherein a plurality of the interdigital transducers are disposed on the quartz substrate;

each of the plurality of interdigital transducers constitutes a one-port surface acoustic wave resonator; and

the plurality of the interdigital transducers are connected to constitute a lattice-type filter on the quartz substrate.

16. A communication device comprising a surface acoustic wave device according to Claim 10.

17. A surface acoustic wave device using a Shear Horizontal type surface acoustic wave, comprising:

a quartz substrate; and

at least one interdigital transducer disposed on the quartz substrate and made from tungsten;

wherein a normalized film thickness h/λ of the at least one interdigital transducer is within a range of about $0.6d + 0.85$ to about $0.6d + 1.30$, where "d" is the metallization ratio of the interdigital transducer, "λ" is the wavelength of the surface acoustic wave, and "h" is the film thickness of the electrodes of the at least one interdigital transducer.

18. A surface acoustic wave device according to Claim

17, wherein the normalized film thickness h/λ is within a range of about $0.6d + 1.00$ to about $0.6d + 1.23$.

19. A surface acoustic wave device according to Claim 17, further comprising a plurality of the interdigital transducers arranged to constitute a longitudinally coupled resonator filter.

20. A surface acoustic wave device according to Claim 19, further comprising a plurality of the longitudinally coupled resonator filters, which are connected in a cascade arrangement in at least two stages.

21. A surface acoustic wave device according to Claim 17, wherein the at least one interdigital transducer is arranged on the quartz substrate to constitute a one-port surface acoustic wave resonator.

22. A surface acoustic wave device according to Claim 17, wherein a plurality of the interdigital transducers are disposed on the quartz substrate;

each of the plurality of interdigital transducers constitutes a one-port surface acoustic wave resonator; and

the plurality of the interdigital transducers are connected to constitute a ladder-type filter on the quartz

substrate.

23. A surface acoustic wave device according to Claim 17, wherein a plurality of the interdigital transducers are disposed on the quartz substrate;

each of the plurality of interdigital transducers constitutes a one-port surface acoustic wave resonator; and

the plurality of the interdigital transducers are connected to constitute a lattice-type filter on the quartz substrate.

24. A communication device comprising a surface acoustic wave device according to Claim 17.

25. A method for manufacturing a surface acoustic wave device using a Shear Horizontal type surface acoustic wave, comprising the steps of:

preparing a quartz substrate;

forming a metal film having a larger mass-load effect than that of aluminum on the quartz substrate; and

patterning the metal film to form at least one interdigital transducer by one of reactive ion etching and a lift-off process such that a metallization ratio "d" and a normalized film thickness h/λ of the at least one interdigital transducer which makes a spurious transversal

mode ripple to be about 1.5 dB or less are satisfied, where "d" is the metallization ratio of the interdigital transducer, "λ" is the wavelength of a surface acoustic wave, and "h" is the film thickness of the interdigital transducer.

26. A method according to Claim 25, wherein the metal film is made from tantalum, and patterning is performed such that the normalized film thickness h/λ is within a range of about 0.6d + 1.50 to about 0.65d + 1.87 to form the at least one interdigital transducer.

27. A method according to Claim 26, wherein patterning is performed such that the normalized film thickness h/λ of the at least one interdigital transducer is within a range of about 0.6d + 1.65 to about 0.6d + 1.81.

28. A method according to Claim 25, wherein the metal film is made from tungsten, and patterning is performed such that the normalized film thickness h/λ is within a range from about 0.6d + 0.85 to about 0.6d + 1.30 to form the at least one interdigital transducer.

29. A method according to Claim 28, wherein patterning is performed such that the normalized film thickness h/λ of the interdigital transducer is within a range from about

0.6d + 1.00 to about 0.6d + 1.23.